

## Self-Efficacy of Agricultural Farmers: A Case Study

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Self-efficacy of agricultural farmer refers to judgment of his capabilities to organize and execute courses of action required to attain designated types of agricultural performance. Current study examined correlates of farmers' self-efficacy. Initially, following the interview with farmers, agricultural officers and members of KPS (Krishi Prajukti Sahayak) Bengali version 20-item summated rating scale with 5 point rating categories was developed to assess self-efficacy of agricultural farmers. Data were collected from 33 agricultural farmers of Dumajuli village of Bhangar block, South 24 Pgs., West Bengal. Reliability in terms of internal consistency among the items was high (Cronbach's alpha = 0.75). It was noted that self-efficacy was related with multiple crop and jute production significantly. Results were discussed in terms of reciprocal deterministic proposition of Self-efficacy suggested by Bandura. Findings have major implications in psychological counseling to the agricultural farmers.

In describing postulates of social cognitive theory, Bandura (1986) coined the term self-efficacy. He assumed that each individual possesses a self-system that enables to exercise a measure of control over thoughts, feelings, motivation, and actions. This self-system provides reference mechanisms and a set of sub-functions for perceiving, regulating, and evaluating behavior, which results from the interplay between the system and environmental sources of influence. As such, it serves a self-regulatory function by providing individuals with the capability to influence their own cognitive processes and actions and thus alter their environments. Self-efficacy researchers applied the construct in education (Pajares & Johnson, 1994; Pajares, 1996, Zimmerman, 1996) and health (Hurley & Shea, 1992; Rosentock, 2000; Bandura, 2000) mainly to explain educational motivation of children and effective health behaviour. No studies yet been conducted in the agriculture sector resulting gap of knowledge as how to improve self-efficacy of agricultural farmers. Current study aims at examining self-efficacy level of agricultural farmers, the people who entirely depend on agricultural farming for livelihood.

### **Conceptual framework**

Agriculture in India is the means of livelihood of almost two thirds of the people. It has always been most important economic sector in India. India's dramatic success in green revolution during 60's makes clear that rural transformation can not be achieved without development of farmer's capability and resource mobilization for agriculture. Attention was paid to development of farmer's capability by resource mobilization. As a result, farmers are exposed to new agricultural technology, use of better seeds, water management and plant protection through different training programs organized by the Government and non-Government agencies. Exposition of different information and adoption of new technology are assumed to develop farmer's self-efficacy. Self-efficacy of farmer refers to judgment of his capabilities to organize and execute courses of action required to attain designated types of agricultural performance. Self-efficacious farmers have belief that they are more competitive, challenging, recognized, curious to know farming practices, able to perceive environmental uncertainty, motivated to learn new skills for

adaptation and able to understand social needs easily. When farmers have lost such belief, his self-efficacy system deteriorates and prolonged deterioration leads him to commit suicide or to take some other profession. The studies related to farmer's suicide provide conceptual base to understand different correlates of self-efficacy. Recently a large number of farmers committed suicides in Andhra Pradesh, Maharashtra and in West Bengal. Kumar and Bhat (2007) in studying agricultural practices of suicide committed and at risk farmers in Andhra Pradesh noted 12 agro-economic reasons for committing suicides. They are:

1. chronic drought and scanty rainfall;
2. lack of underground water;
3. high cost of cultivation with inadequate reasons;
4. crop failures and low yields;
5. lack of remunerative prices for the farm produce;
6. spurious fertilizers, pesticides and seeds;
7. lack of sufficient institutional credit flows;
8. high rates of rent charged by land owners and high interest rates charged by private money lenders;
9. failure of agriculture related cooperative banks in lending money to farmers;
10. lack of sustainable irrigation facilities;
11. failure in their attempts to generate water through wells and borewells;
12. inadequate and unorganised agricultural market facilities for farmers etc.

Authors identified some psychological factors as loss of self-esteem, ego and prides; feeling of shame and insult; feeling hurt; suffering from alienation characterized by helplessness; isolation, meaninglessness, powerlessness, and self-estrangement. Assuming suicide is a solution for insoluble problem and termination of distressing thoughts and feelings, farmers committed suicide. In 2005, Tata Institute of Social Sciences in their final report submitted to the Mumbai High court highlighted some reasons

for suicides committed by Maharashtra farmers using life history approach, and focus group discussions. These are Repeated crop failures, inability to meet the rising cost of cultivation, and indebtedness. Researchers have concluded that not all farmers facing these conditions commit suicide — it is only those who seem to have felt that they have exhausted all avenues of securing support have taken their lives. This suggests creation of low self-efficacy among the farmers. National Crime Records Bureau (2006) noted that West Bengal topped the list of suicides with 15,725 suicides, including 6,605 women, compared to 15,015 in 2005 and 13,424 in the previous year. Most of the suicides were committed in rural west Bengal. Exact reasons for their suicides have not been studied. To sum up, if we consider suicide as the extreme stage of low self-efficacy, the reasons for suicides will help us to explore some of the variables assumed to be correlated with self efficacy of agricultural farmers. These are age, educational levels, family size, number of crops, types of crops and land size. Second objective of this study was to examine pattern of relation between self-efficacy and those five variables.

## **Method**

### **Sample:**

Data were collected from 33 agricultural farmers of Dumajuli village of Bhangar block of South 24 paraganas in West Bengal. The block was selected for 3 reasons. Here the farmers were trained to move from organic farming to chemical farming, from traditional crop (paddy, jute, vegetables) to non-traditional crops (wheat, potatoes, mustard etc.) and the area was very close to Kolkata by road. Focused group discussion was conducted initially to prepare introductory schedule and to explore reasons for improving self-efficacy of farmers. The meeting was held on 17<sup>th</sup> November, 2007 when deadliest tropical cyclone Sidr hit the Bangladesh. During the meeting, the cyclone passed over the village. Meeting was held in a cottage.

Initially, 50 farmers attended the meeting. But due to heavy storm and shower, 17 left. On that day, more number of labourers left to kolkata for political meeting. The farmers were middle aged (Mean = 43.57, SD=13.81 years) and had long experience in agricultural practices (Mean years of experience = 20.86, SD=12.32 years). Their lands were small (Mean = 102.72, SD=84.23 Kathas). Their family size was comparatively large (Mean = 7.54, SD=2.74). Educational level was less than school final (Mean = 8.74, SD = 2.57 grades). Most of the farmers were Paddy (90%), jute(67%) and vegetable (60%) growers. Some of them cultivated potato (33%), wheat (47%), and mastard (47%). In average, farmers followed multiple crops. In average, they cultivated 3 crops. Multiple cropping refers to growing more than one crop per year per hectre.

#### **Measures:**

**a) Demographic and agricultural variables:** Demographic information like age, educational levels, family size, number of crops, types of crop production, land sizes was assessed using introductory schedule. As local people produced paddy, jute, vegetables, mastard and wheat crops, only these crops were used in the schedule.

**b) Self-efficacy:** Following the interview with farmers, agricultural officers and members of KPS (krishi prajukti sahayak), a Bengali version 20-item summated rating scale with 5 point rating categories was developed to assess self-efficacy of farmers. The scale assesses to what extent farmer has belief in self recognition, curiosity to know, in abilities to compete, to consider new farming method as challenging, proactive, to imitate new skills and abilities to understand social needs. The 5 point rating categories are (i) to a greater extent (ii) great extent (iii) neither agree nor disagree (iv) less extent (v) least extent. Of 20 items, 6 items were reverse and they were scored in reverse. High score indicates high self-efficacy level. Means, SDs and coefficient of variation for each item are

given in Table 1. Cronbach's alpha was 0.75 suggesting high internal consistency among the items.

### **Results and Discussion**

Results revealed two things – (a) self-efficacy level of agricultural farmers and (b) pattern of relation with demographic and agricultural variables.

#### **Levels**

Level of self-efficacy was measured in terms of average rating. Highest score on this current scale is 5. Figure 1 shows no outlier in distribution suggesting good distribution of self-efficacy data. Results revealed that in average farmers were more self-efficacious (Mean = 3.67, SD = 1.55). They were more efficacious in successful farming (Mean=4.33, SD=1.35), in competitive attitude (Mean=4.07, SD=1.44), in performance (Mean=4.40, SD=0.93), and in imitating good farmers (Mean=4.30, SD=1.34). They brooded more to get good crops (Mean = 4.17, SD = 1.39).. They thought much receiving high or low production in order to find out the reasons (Mean = 3.63, SD = 1.52).. This behaviour helps them to control over the environment. Bandura in his reciprocal deterministic proposition suggested sets of behaviour like monitoring, judging, imagining and modeling that will help to control over the environment. Results noted that farmers followed these sets of behaviour. Possibly, due to this reason, results show that farmers were more self-efficacious.

Table 1 shows that farmers had more difficulty to use new agricultural procedures (Mean=2.77, SD=1.89). New agriculture procedure refers to non organic farming. This issue should be thought over seriously as self-efficacious person accepts innovation. In the current location, farmers use organic farming learnt from generation to generation. Organic farming is a method of crop and livestock production that involves much more than choosing not to use certain pesticides, fertilizers, genetically modified organisms,

antibiotics, and growth hormones that are not permitted by organic standards. Organic food production prohibits using highly soluble or synthetically compounded mineral fertilizers, synthetically compounded pesticides, growth regulators, antibiotics, hormones, colouring or other artificial additives, ionizing radiation, and recombinant genetic engineered plants or animals (genetically engineered organisms - GEO). Learning about non organic farming requires higher education as basic education is not sufficient to understand the nature of chemical components used in fertilizers and pesticides. In another study, Muthayya (1971) observed that out of 100 farmers in low socio economic status, 62 aspired for higher education. Misuse or inappropriate use of chemicals on plant or on land can maximize soil degradation, erosion, increase pollution

and will deteriorate bio-diversity. Possibly, due to this reason, farmers had difficulty to understand new agriculture procedures or non organic farming. To make the farmers motivated to non organic farming, attention should be paid to adequate training in considering their basic educational level. During the training, information education and communication (IEC) system should be followed otherwise, farmers can not understand or remember much.

**Table-1 Means, SDs and coefficients of variations for each item of Self-efficacy scale (n=33)**

Items Description	Mean	SD	Co-efficient of variation
1 Everyone knows that I am a successful farmer	4.33	1.35	0.31
2 People say that I cultivate well	3.53	1.41	0.40
3 I can not use all my capacities to be a successful farmer ( R )	3.14	1.30	0.41
4 I have no difficulty to use new agricultural procedures	2.77	1.89	0.68
5 I am success in dealing with any agricultural problems	3.23	1.52	0.47
6 I can not grow good amount of crops if I would be away from traditional agricultural practices ( R )	3.07	1.66	0.54
7 Comparing with others, I grow more amount of crops	3.30	1.58	0.48
8 I am failure in agricultural competition ( R )	4.07	1.44	0.35
9 No one can defeat me in crop production	3.33	1.67	0.50
10 I can understand any sort of agricultural discussion	3.67	1.54	0.42
11 I can grow crops whether there would be any drought or heavy shower	3.00	1.58	0.53
12 To grow good crops, I can do more work	4.40	0.93	0.21
13 I am proud of being a successful farmer	3.97	1.54	0.39
14 I imitate good farmers	4.30	1.34	0.31
15 I brood as how to get good crops	4.17	1.39	0.33
16 I do not like to think much about less production. ( R )	3.63	1.52	0.42
17 Always I try to remove all troubles in agriculture	4.17	1.32	0.32
18 If luck favours, there are good amount of crops ( R )	3.07	1.87	0.61
19 I want to find reasons when I get good crops	4.30	1.09	0.25
20 It is useless to devote much time to think about agriculture ( R ).	3.87	1.48	0.38

### Relations

Table 2 shows demographic data like age, years of cultivation experience, land size, family size, educational level were not significantly correlated with self-efficacy.

Rather self-efficacy was significantly correlated with production of jute and number of crops only. This suggests that farmers who cultivated jute and more number of crops possessed high self-efficacy level.

**Table-2 Means, SDs and correlations between self-efficacy with demographic and agricultural data**

	Mean	SD	r	t	p-level	N
Age	43.57	13.81	0.06	0.31	0.76	30
Years of experience	20.86	12.32	0.12	0.64	0.53	28
Land sizes in Katha	105.72	84.23	-0.10	-0.52	0.61	29
Family Sizes	7.54	2.74	0.04	0.22	0.83	28
Education	8.74	2.57	0.10	0.52	0.61	27
Potato	0.33	0.48	0.24	1.34	0.19	30
Paddy	0.90	0.31	0.25	1.34	0.19	30
Vegetables	0.60	0.50	0.08	0.44	0.66	30
Master	0.47	0.51	0.35	1.96	0.06	30
Wheat	0.47	0.51	0.35	2.00	0.06	30
Jute	0.67	0.48	0.41	2.35	0.03	30
Total number of crops	3.43	1.55	0.51	3.11	0.00	30

Obtained results depict picture about agricultural behaviour of self-efficacious farmer. To self efficacious farmer, environmental uncertainty is not a threat rather it is a challenge. In the context of agriculture, seasonal variation is the uncertainty. In India, sowing and growing crops depend upon seasonal variation. April, one of the hottest month is the sowing season for summer crops, July is the post monsoon, growing season for summer crops. October is both the harvesting season for summer crops and the sowing season for winter crops. January, is the growing season for winter crops. When environment is not under his control, self-efficacious person follows the rules of environment. Multiple cropping behaviour of farmers as revealed from the results supports this notion. In case of multiple crop production, farmers sow more than one crop in the same season. In crop selection, they pay attention to the similar soil characteristics and water demands. For example, they sow paddy seeds and vegetables in the same hectre of land. Currently, horticulture is considered as multiple crops. Therefore, in the same land, some areas are used for corn seeds and some for

flower plants. Multiple cropping gives them more revenue than mono cropping. Again, this helps optimum use of land productivity. Multiple cropping makes them multi-tasking as they have to perform multiple functions for multiple crop production. In Africa, multiple crop is the encouraging event. There, along with corns, farmers plant trees. The trees start to grow slowly, permitting the grain crop to mature and be harvested. Then the trees grow quickly to several feet in height, dropping leaves that provide nitrogen and organic matter – both sorely needed in African soils. The wood is then cut and used for fuel. In India, tribal people in North-Eastern states practice Jhum cultivation or shifting cultivation. There, multiple crop production is the common phenomena. However, Government of India does not encourage Jhum cultivation now because of several disadvantages.

Results noted high self efficacy among the Jute growers. Jute needs a plain alluvial soil and standing water. In comparison with paddy, jute production is less costly as it is a rain-fed crop with little need for fertilizer or pesticides. Possibly, due to this reason, jute growing farmers get more revenue and

become more self-efficacious. In the reciprocal deterministic proposition, Bandura (1986) suggested that environment causes behaviour true, but behaviour causes the environment. Behaviour includes use of cognitions – monitoring, judging, imagining, imitating successful persons etc. for goal achievement. Results show that farmers follow all the functions. They like much thinking to find out reasons for less or more production, imitating successful farmers.

Psychologists working in the field of agriculture contributed mainly on 4 areas (a) assessment of the therapeutic needs of rural population (Henggeler, 1983) ; (b) investigation of farming tasks and skills (Matthews, 1978); (c) analysis of expert agricultural judges (Trumbo, Adams, Milner, and Schipper, 1962); and (d) evaluation of farm management decisions (Rogers, 1962). Current study contributed another approach in agricultural psychology.

To sum up, current study provides a reliable questionnaire to assess self efficacy of agricultural farmers and it provides knowledge about agriculture practices of self-efficacious farmers. In psychological counseling to low self efficacious farmers, psychologists can use the questionnaire to explore key areas that will heighten self-efficacy level. Findings of the study provide new knowledge about psychological dimension related to agricultural practices.

### References

- Bandura, A. (2000). Health promotion from the perspective of social cognitive theory. In P. Norman, C. Abraham, and M. Conner (Eds.), *Understanding and changing health behaviour* (pp. 299-339). Amsterdam: Harwood Academic.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Henggeler, S. W. (1983). Needs assessments in rural areas: Issues and problems. In A. W. Childs & G. B. Melton (Eds.), *Rural psychology*. NY: Plenum Press.
- Hurley, C., & Shea, C. (1992). Self-efficacy: Strategy for enhancing diabetes self-care. *The Diabetes Educator*, 18, 146-150.
- Matthews, J. (1978). The farm worker. In W. T. Singleton (Ed.), *The analysis of practical skills*. Baltimore: University Park Press.
- Muthayya, B. C. (1971). *Farmers and their aspirations*. Hyderabad: National institute of community development.
- Pajares, F. (1996). Self-efficacy beliefs and mathematical problem solving of gifted students. *Contemporary Educational Psychology*, 21, 325-344.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66, 543-578.
- Pajares, F., & Johnson, M. J. (1994). Confidence and competence in writing: The role of self-efficacy, outcome expectancy, and apprehension. *Research in the Teaching of English*, 28, 316-334.
- Pajares, F., & Johnson, M. J. (1996). Self-efficacy beliefs in the writing of high school students: A path analysis. *Psychology in the Schools*, 33, 163-175.
- Rogers, E. M. (1962). *Diffusion of innovations*. NY: The Free Press.
- Rosenstock, L. M. (2000). Health belief model. In A. E. Kazdin (Ed.), *Encyclopaedia of Psychology* (vol. 4., pp. 78-80). Washington, DC: American Psychological Association.
- Trumbo, D., Adams, C., Milner, M., & Schipper, L. (1962). Reliability and accuracy in the inspection of hard red winter wheat. *Cereal Science Today*, 7, 62-71.
- Zimmerman, B. J. (1995). Self-efficacy and educational development. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 202-231). New York: Cambridge University Press.
- Zimmerman, B. J. (1996). *Measuring and mismeasuring academic self-efficacy: Dimensions, problems, and misconceptions*. Symposium presented at the meeting of the American Educational Association, New York.

Received: March 21, 2009

Accepted: May 31, 2009

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